METHODOLOGY FOR FAST AND STANDARDIZED DEPLOYMENT OF INTEGRATED BEHIND THE METER POWER PLANT CONTROLS

Modularity paired with standardization creates **AGILITY** and **RELIABILITY**, and that's what the next generation of on-site power requires.

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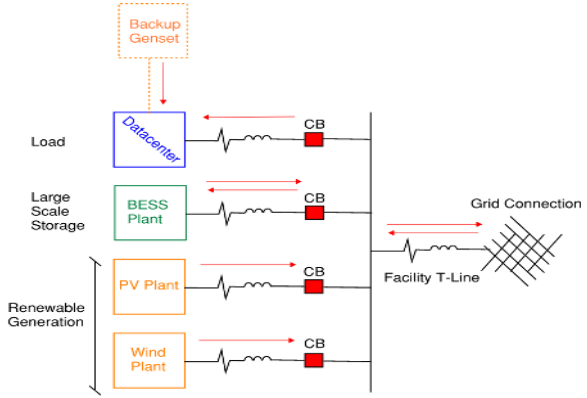
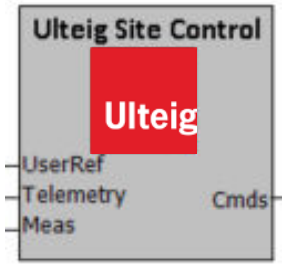
INTRODUCTION

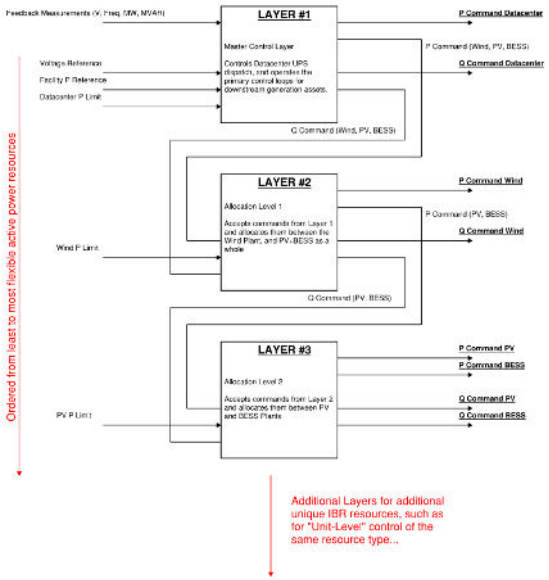
Integrating renewable generation with large loads is a critical challenge in scaling next-generation energy systems. By using a modular controller design approach, it can be demonstrated how a control philosophy developed in the context of hybrid IBR controls can be expanded to larger behind-the-meter systems where IBR resources are integrated with large electronic loads.



DISCUSSION

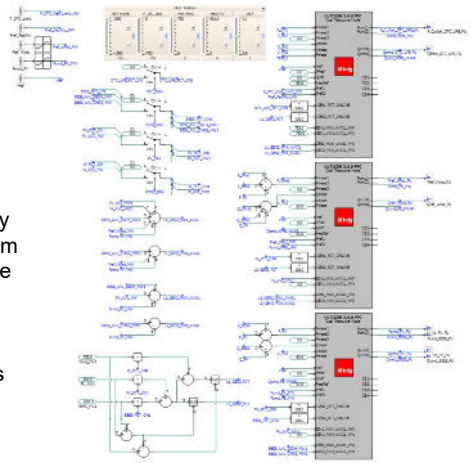
A modular approach to controller design makes the simultaneous control of multiple generation assets and large loads much simpler. By stacking individually configured yet identically designed control modules on top of each other as "layers", completely unique control systems designs can be quickly formulated.





METHODS

With dynamic modelling and 1:1 real-code controller models, utilizing a "Model-First" approach to designing control systems allows the project team to study the full control system design (with software such as PSSE, PSCAD, and TSAT) against an endless number of scenarios which cannot be tested in the field.



RESULTS

This series of plots shows a hypergrid system response against a severe low voltage ride-through event. An iterative model-first approach to controller design and commissioning reduces on-site risk by studying how the facility, under this control system approach, responds to various conditions, events and disturbances.
This can either be according to custom-designed studies or prescribed dynamic studies such as the ERCOT MQT as an example.